Abalone Resurvey in the Southeast Queen Charlotte Islands, July 1984

J. A. Boutillier, W. Carolsfeld, P. A. Breen,
S. Farlinger, and K. Bates

Department of Fisheries and Oceans
Fisheries Reseach Branch
Pacific Biological Station
Nanaimo, British Columbia V9R 5K6

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ABALONE RESURVEY IN THE SOUTHEAST QUEEN CHARLOTTE ISLANDS, JULY 1984

by

J. A. Boutillier, W. Carolsfeld, P. A. Breen, S. Farlinger[1], and K. Bates[1]

Department of Fisheries and Oceans
Fisheries Research Branch
Pacific Biological Station
Nanaimo, British Columbia V9R 5K6

[1]Present Address: Dept. of Fisheries and Oceans
Field Services Branch
Federal Building, Room 117
417 2nd Ave. West
Prince Rupert, British Columbia V8J 1G8

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ABSTRACT

Boutillier, J. A., W. Carolsfeld, P. A. Breen, S. Farlinger and K. Bates. 1985. Abalone resurvey in the south-east Queen Charlotte Islands, July 1984. Can. MS Rep. Fish. Aquat. Sci. 1818: 87 p.

A resurvey of northern abalone (Haliotis kamtschatkana) abundance was conducted on the south-east coast of the Queen Charlotte Islands, British Columbia, Canada, to assess suspected declines of stocks. Three biologists and a commercial abalone diver sampled 70 sites on the east coast of Moresby Island during July 1984. A comparison of 61 sites with results from previous surveys in 1978 and 1979, showed significant declines of 75% for legal-sized abalone and 81% for total abalone stocks. The observed continuing decline of abalone in this area, together with similar results from a survey of the central coast of B.C. in 1983, indicates that the stock is not at equilibrium.

RÉSUMÉ

Boutillier, J. A., W. Carolsfeld, P. A. Breen, S. Farlinger and K. Bates. 1985. Abalone resurvey in the south-east Queen Charlotte Islands, July 1984. Can. MS Rep. Fish. Aquat. Sci. 1818: 87 p.

Dans le but d'évaluer le déclin soupçonné des stocks, on a mené un nouveau relevé de l'abondance de l'ormeau (Haliotis kamtschatkana) sur le littoral sud-est des îles Reine-Charlotte (Colombie-Britannique). En juillet 1984, trois biologistes et un plongeur commercial (pêcheur de l'ormeau) ont échantillonné 70 emplacements sur la côte est de l'île Moresby. Une comparaison des résultats recueillis à 61 emplacements et ceux de relevés antérieurs effectués en 1978 et 1979 a révélé des baisses importantes se chiffrant à 75% pour les ormeaux de taille légale et à 81% pour tous les stocks. Le déclin soutenu observé de l'ormeau dans cette région et les résultats semblables obtenus d'un relevé de la côte centrale de la C.-B. réalisé en 1983 indiquent que le stock n'est pas en équilibre.

INTRODUCTION

The east coast of the Queen Charlotte Islands, Area 2E (Fig. 1), was the major producer of northern abalone (Haliotis kamtschatkana) during the peak years of the abalone fishery in B.C., 1976-80 (Fedorenko and Sprout 1982). Subsequently Area 6 became the major producing area and Area 2E the second or third ranked producer (Table 1). Since 1979 the fishery has been regulated by an annual quota, based on work by Breen (1980) and Breen and Adkins (1981, 1982). In 1980 a quota of 113.4 t was set, at the estimated equilibrium catch level (Breen 1980). By 1983 the quota had been reduced to 58.2 t since indications were that abalone stocks continued to decline. Because of concerns by fishery officers and management biologists of indications of continued declines of abalone stocks in B.C., a jointly sponsored survey was carried out in Area 6 in May 1983 (Boutillier et. al. 1984). The observed 45-55% decrease in legal-sized abalone abundance confirmed the validity of the concerns, which were based on a declining catch/unit effort reported by fishermen (K. Bates, unpublished data), changing fishing patterns, and anecdotal information from fishermen and fishery officers. The drastic decline in abalone abundance in Area 6 resulted in recommendations to resurvey Area 2E to determine if the reduction of abalone stocks may be a coastwise phenomenon.

The present survey was designed to meet several objectives. First, since the area had been subjected to a quantitative examination in 1978 and 1979 (Breen and Adkins 1979, 1981), the survey compared present abundance with past abundance at selected sites. Second, since some areas in Area 2E have been closed to commercial fishing while other areas have been open, the survey compared the magnitude of any declines in open and closed areas. Third, because the previous survey only collected abalone on exposed surfaces of rocks, while this survey collected abalone both on exposed surfaces and by turning rocks over, a comparison of the two collection methods was made. Fourth, a few sites were placed in new areas to develop base-line data in these areas for future reference.

METHODS

The survey was carried out by Susan Farlinger, Kevin Bates (Field Services Branch); Wolfgang Carolsfeld (Fisheries Research Branch); and Alan Irving (commercial abalone diver). The commercial diver and support vessel was chosen by calling tenders. The supporting vessels with crew were the commercial vessel Beowulf and the fishery patrol vessel Pillar Rock.

Most sites were selected by relocating sites that had high densities of abalone at the time of Breen and Adkins surveys in August 1978 and July 1979. New site locations were selected in consultation with commercial fishermen and reference to chart characteristics. In relocating previously surveyed locations (Table 2), the diving teams relied on a set of field notes

and charts, because none of the members of the present survey team were involved in the 1978-79 work. The actual site location was probably within one hundred meters of the previous site.

The sampling techniques followed the procedures described by Breen and Adkins (1979). Each site was located by surface landmarks, to eliminate biases that might occur by selecting general sites using a series of underwater observations. The topography, substrate type, exposure, and dominant algae were visually identified and the percentage cover was estimated and recorded. Density was estimated by collecting all abalone found within a square metal 1 m^2 quadrat which was used to sample the bottom in a standard 16 quadrat pattern. The top of the abalone zone was determined from the minimum depth at which abalone were observed during the first upslope swim from the dive entry point. The first quadrat was placed 5 m horizontally from the point of abalone zone determination. Subsequent sampling was carried out in a direction away from this point to prevent biases that may occur in first quadrat selection due to the presence or absence of abalone. The second to fourth quadrats in this transect were run downslope or at right angles to the kelp bed edges and were separated by 1 m; three similar transects of 4 quadrats were run parallel to the first with each transect being separated by 4 m.

Within each quadrat all kelp plants that obscured vision were cut and removed. Two separate collections of abalone were made within the quadrat: those abalone found without moving rocks were counted, collected, and kept separate from those abalone found by removing and examining movable rocks. The maximum shell length of all collected abalone were measured to the nearest mm. Sampling of a site was abandoned when no abalone were found in the first 8 quadrats or inclement diving conditions prevented work continuing. Of the 70 sites, 10 sites were not completely sampled for these reasons.

RESULTS

A total of 70 dives were made in the area from Heater Harbour to Limestone Islands. Appendix table 1 provides a description of the diving sites in terms of general location, exposure, substrate, slope, algal cover, and quadrat density of the target and other dominant animal species.

Abalone density comparison

Of the 70 dives made, 61 were conducted in a place and manner which allowed for a comparison of mean total densities and mean legal-sized densities with the 1978-79 survey results using a paired T-test. Summaries of these densities for the present and previous surveys are shown in Table 3. To insure that both surveys were comparable, the data presented and used in this analysis were only collected from abalone found on rocks.

From the comparison of these 61 sites, both the total density and legal-sized density have declined significantly in the past 5-6 years by an average of 81% and 75% respectively as seen in the table below. The null hypothesis that mean density in the 1978-79 survey was the same as the mean density in the 1984 survey was rejected for both total density and legal-sized density.

Abalone density at 61 sites (#/m^2)		
Year	Mean total density	Mean legal density
1978-79	2.82	0.36
1984	0.54	0.09
Percent change	81 %	75 %

A comparison of pre-recruits and new recruits, as described by Breen (1980), at all 70 sites showed similar declines as seen in the table below.

Abalone density (#/m^2)		
Survey year	Pre-recruits 94 - 101 mm	New recruits 102 - 107 mm
1978-79	0.27	0.22
1984	0.06	0.04
Percent change	78 %	82 %

Comparison of open and closed areas

A comparison was made of closed and open areas to determine if the decline was also apparent in areas closed to fishing. The closed region (area 2 sub-area 11) according to Bates (1984) has been closed to commercial fishing since 1973 because this area was important in terms of native and recreational harvest.

A paired T test and a Wilcoxon signed rank test compared mean densities from repeated sites in both open and closed areas. The mean decline in legal and total abundance estimates from the 1978-79 surveys to the present survey and the level of significance of these declines are shown below.

Area	Type of mean density	N	Mean density 1978-79	Mean density 1984	Change in mean (#/m2)	Significance T test	Significance Wilcoxon
Open	Total	42	2.401	0.456	-1.9	0.0001	0.0000
Open	Legal	42	0.306	0.088	-0.2	0.0003	0.0002
Closed	Total	19	3.743	0.734	-3.0	0.0001	0.0001
Closed	Legal	19	0.490	0.106	-0.4	0.0650	0.0202

Comparison of surface collections and under rock searches

Mean total density of abalone over the entire area for all 70 dives was 0.52 per square meter for abalone collected on the rocks. This density increased to 0.65 when abalone found under rocks were included. The mean density of legal-sized abalone found on rocks and on the underside of rocks were 0.09 and 0.10 respectively. Comparing the two methods of collection and estimating density shows that a survey which collects abalone by turning over rocks increased the mean total density by .13 abalone per square meter or 25% and the mean legal density by .01 abalone per square meter or 11%. In the surface collection, legal abalone were found to make up 17% of the total density while in collections from under rocks, legal abalone were found to make up 8% of the total density. This apparent shift in relative proportions of legal and sublegal densities can be seen in the length frequency histograms (Figs. 2 and 3).

New baseline sites

Most of the new sites were located in Luxana Bay, with two additional sites placed at Kunga and Lyell Islands.

DISCUSSION

These results show that abalone populations have decreased significantly since 1978-79. Both legal-sized abalone and total abalone densities have decreased (75% and 81% respectively). From previous surveys it was estimated that legal-sized density might have declined by as much as 75% from pre-1976 levels in this area (Breen 1980). This further decline indicates that present stocks are now at very low levels compared with previous abundances. A similar survey, conducted in an area on the opposite side of Hecate Strait in 1983 (Boutillier et al. 1984) reached similar conclusions for that area. These two studies were based in areas that once produced a large proportion of total landings; thus it appears that stocks may have experienced

a general decline. The fishery is managed by an annual quota (Federenko and Sprout 1982) which was originally based on an estimate of annual equilibrium production (Breen 1980). Continuing decline indicates that the stock is not at equilibrium, and a review of management approach is required. To develop rationale management strategies requires that we understand the decline.

Several processes might be responsible for the continuing decline in abalone abundance. First, some sub-legal mortality is caused by the fishery when abalone are removed, measured (either underwater or on board the tender), and returned. Such mortality may be caused when physical damage to the animal results in bleeding; when predators take opportunity of stress, disorientation, injury or weakened attachment in replaced abalone; or when abalone are returned to unsuitable substrates. Such mortalities are thought to be a major problem in strongly exploited stocks (Burge et al. 1975). However, because it acts only on sublegal abalone close enough to legal size to warrant measurement, this mechanism by itself could not cause the large decrease seen in sub-legal abalone.

A second possible cause is recruitment overfishing (Gulland 1973). The stock-recruit relation is not known for any species of abalone. Nevertheless, if the legal-sized part of the population (which contributes most of the gametes) has declined to a small percentage of its previous level, then one might expect to see decreased reproductive success and later reduced recruitment. It is clear that both juvenile abundance and recruitment to the fishery have decreased since the fishery began. However, it is not clear that the fishery has caused these changes. Breen (Management of the B. C. fishery for northern abalone (Haliotis Kamtschatkana). Presented at North Pacific Invertebrate workshop, May 1984) suggests that recruitment to the fishery was lower than replacement levels shortly after the fishery began, several years before any real impact of the fishery would be detectable. Recruitment to the fishery is 7-10 years (Breen 1980), and the fishery began (for the practical purposes of this discussion) in 1976. Thus, if the fishery had had a negative impact on reproductive success and subsequent recruitment to the stock, it would still be too early to detect the latter.

A third possibility is that environmental effects are responsible for reduced reproductive success, and perhaps even for reduced survival of abalone. This has been observed in abalone populations elsewhere (eg. in New Zealand (Sainsbury 1982) and the Channel Islands (Forster et al. 1982). Breen (Management of the B. C. fishery for northern abalone (Haliotis Kamtschatkana). Presented at North Pacific Invertebrate workshop, May 1984) discusses this possibility with reference to H. kamtschatkana, and suggests that populations have experienced previous fluctuations of large magnitude in the absence of a fishery.

These explanations are not exclusive, and it is also possible that some combination of factors has resulted in the present low stock size, reduced juvenile abundance, and reduced recruitment rate.

From the comparison made in this survey, it appears that abalone have decreased significantly in closed areas as well as in areas open to the commercial fishery. Before one concludes that the fishery is therefore unimportant in explaining abalone abundance, one must consider the impact of native and recreational harvest in the closed area. Unfortunately, neither

has been studied, and the magnitude of the fishery is unknown. It is possible that these users have contributed to the observed decline in legal abalone within the closed area. The decreased abundance of sublegal abalone within this area may, as discussed above, have resulted from reduced spawning stock, environmental changes, or a combination of these. Since abalone spend about 7 days in the plankton before metapmorphosis, juveniles found within the closed area may have originated outside the area. Thus the comparison of open and closed areas is not a simple one.

ACKNOWLEDGMENTS

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Table 1. Total abalone landings in B.C., and landings in area 2E, 1970-1983. Fran Bates (1984).

Year	Total landings (kg)	Area 2E landings (kg)	Area 2E Percentage of total landings
1970	16,238	0	0 %
1971	6,441	0	0 %
1972	59,602	0	0 %
1973	67,131	5,443	8.1 %
1974	26,308	0	0 %
1975	56,699	2,268	4.0 %
1976	273,061	112,037	41.0 %
1977	481,373	259,463	53.9 %
1978	404,212	101,257	25.1 %
1979	208,169	24,874	11.9 %
1980	107,619	12,537	11.6 %
1981	93,651	21,321	23.0 %
1982	82,175	13,538	16.5 %
1983	58,813	20,643	35.0 %

Table 2. 1984 survey site numbers and the 1978-1979 historic site numbers with which they were compared.

1984 site number	Old site number	1984 site number	Old site number
01	79-42	36	78-65
02	79-43	37	78-67
03	79-44	38	78-69
04	New site	39	78-71
05	New site	40	78-80
06	New site	41	78-82
07	New site	42	78-88
08	New site	43	78-91
09	New site	44	78-68
10	78-118	45	78-78
11	78-122	46	78-72
12	78-123	47	New Site
13	78-128	48	78-64
14	78-114	49	78-75
15	78-124	50	78-70
16	78-118	51	78-74
17	78-126	52	78-56
18	78-115	53	78-59
19	78-113	54	78-79
20	78-127	55	78-55
21	78-125	56	78-57
22	78-94	57	78-53
23	78-96	58	78-51
24	78-100	59	78-40
25	78-98	60	New Site
26	78-103	61	78-50
27	78-95	62	New Site
28	78-99	63	78-38
29	78-107	64	78-41
30	78-105	65	78-30
31	78-104	66	78-31
32	78-102	67	78-19
33	78-109	68	78-34
34	78-111	69	78-32
35	79-106	70	78-33

Table 3. Comparison of abalone densities (numbers per sq m) in 1978-1979 and 1984 (#/m^2).

1984 site number	Previous mean total density	Previous mean legal density	Present mean total density	Present mean legal density	Location: fisheries statistical subarea
01	1.63	0.31	1.06	0.13	19
02	2.38	0.90	0.38	0.13	19
03	0.75	0.28	0.38	0.25	19
10	1.06	0.06	0.75	0.06	17
11	0.19	0.06	0.00	0.00	17
12	0.00	0.00	0.19	0.06	17
13	2.31	0.00	0.31	0.00	17
14	2.31	0.93	0.56	0.06	17
15	3.31	0.13	0.50	0.00	17
16	2.44	0.19	0.06	0.00	17
17	1.19	0.00	0.06	0.00	17
18	1.44	0.44	0.81	0.38	17
19	1.00	0.00	0.00	0.00	17
20	1.13	0.00	1.63	0.00	15
21	0.94	0.19	0.00	0.00	15
22	1.63	0.00	0.19	0.00	15
23	1.13	0.11	0.63	0.25	15
24	0.81	0.44	0.75	0.06	15
25	2.25	0.11	0.81	0.31	15
26	0.63	0.56	1.94	0.44	15
27	0.63	0.13	0.00	0.00	15
28	2.88	0.06	1.06	0.00	15
29	0.94	0.00	0.63	0.00	15
30	3.31	0.00	1.19	0.00	14
31	1.75	0.00	0.56	0.31	14
32	5.63	0.44	0.00	0.00	14
33	3.06	1.13	0.81	0.31	15
34	5.94	0.25	0.94	0.19	14
35	0.31	0.00	0.38	0.31	14
36	2.44	0.00	0.00	0.00	12
37	1.13	0.00	0.00	0.00	11
38	2.44	0.31	1.00	0.00	11
39	5.31	0.00	1.81	0.00	11
40	1.00	0.00	0.13	0.00	11
41	0.25	0.00	0.06	0.06	11
42	16.63	1.19	0.06	0.00	12
43	9.38	0.47	0.31	0.00	12
44	5.94	0.06	0.13	0.00	11
45	4.25	0.13	0.75	0.19	11
46	7.06	0.00	0.56	0.00	11
48	3.75	0.56	1.19	0.38	11
49	1.81	1.63	0.50	0.38	11

Table 3 (cont'd)

1984 site number	Previous mean total density	Previous mean legal density	Present mean total density	Present mean legal density	Location: fisheries statistical subarea
50	0.63	0.57	1.19	0.75	11
51	0.75	0.67	0.00	0.00	11
52	8.90	0.00	1.94	0.00	11
53	8.13	1.22	0.19	0.00	11
54	0.63	0.00	0.81	0.06	11
55	5.88	3.54	0.88	0.06	11
56	7.25	0.36	1.75	0.13	11
57	2.63	0.13	1.00	0.00	11
58	3.38	0.13	0.06	0.00	11
59	1.44	0.36	0.88	0.13	08
61	3.06	0.75	0.31	0.19	08
63	1.44	0.19	0.13	0.00	08
64	2.19	1.38	0.06	0.00	08
65	1.06	0.05	0.13	0.00	07
66	0.63	0.31	0.13	0.06	07
67	0.94	0.14	0.00	0.00	07
68	1.13	0.38	0.19	0.00	07
69	3.88	0.39	0.06	0.00	07
70	3.63	0.54	0.31	0.06	07

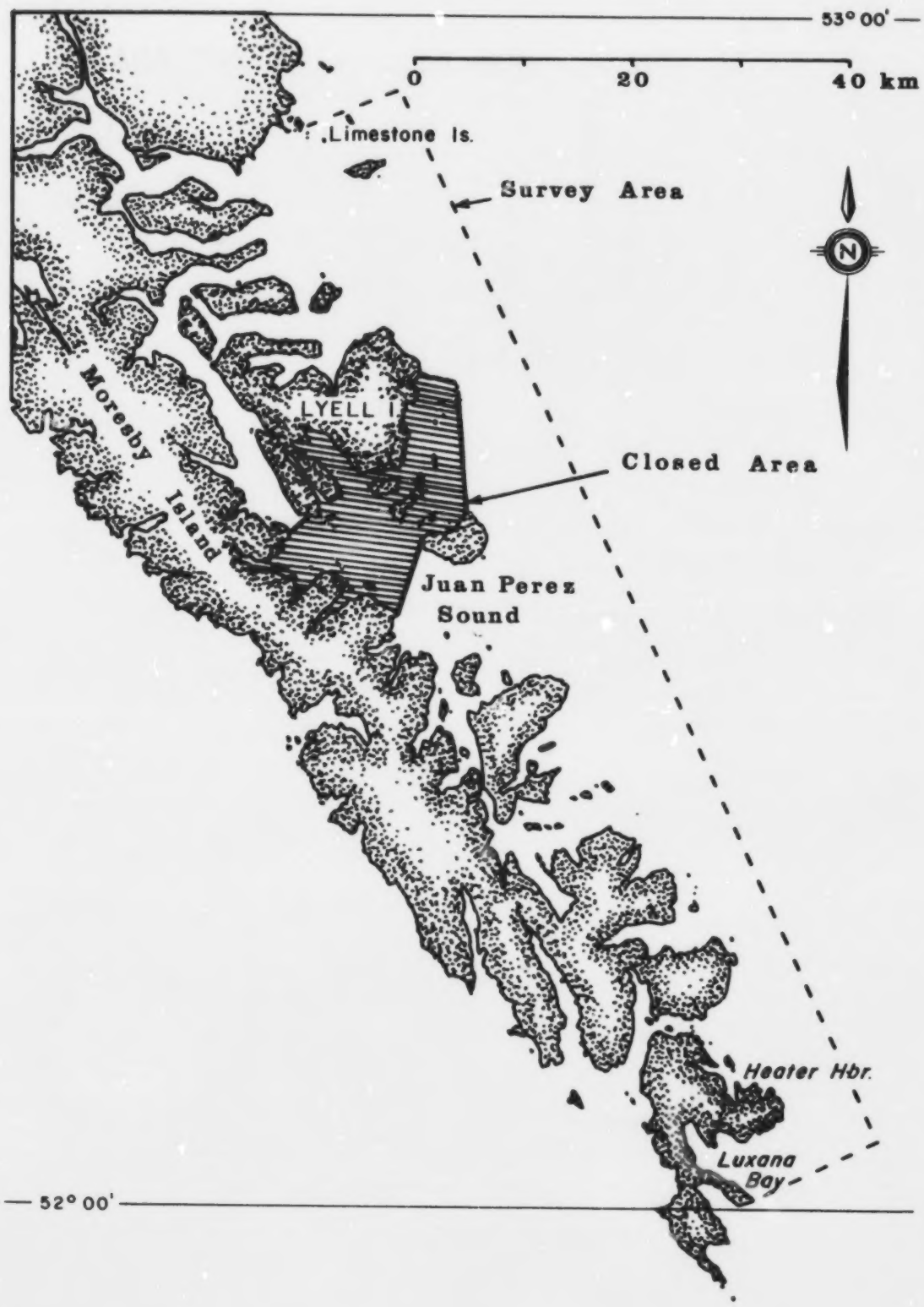


Figure 1. Abalone survey area on the east coast of the Queen Charlotte Islands, 1984.

Fig. 2. ABALONE: All areas on rocks

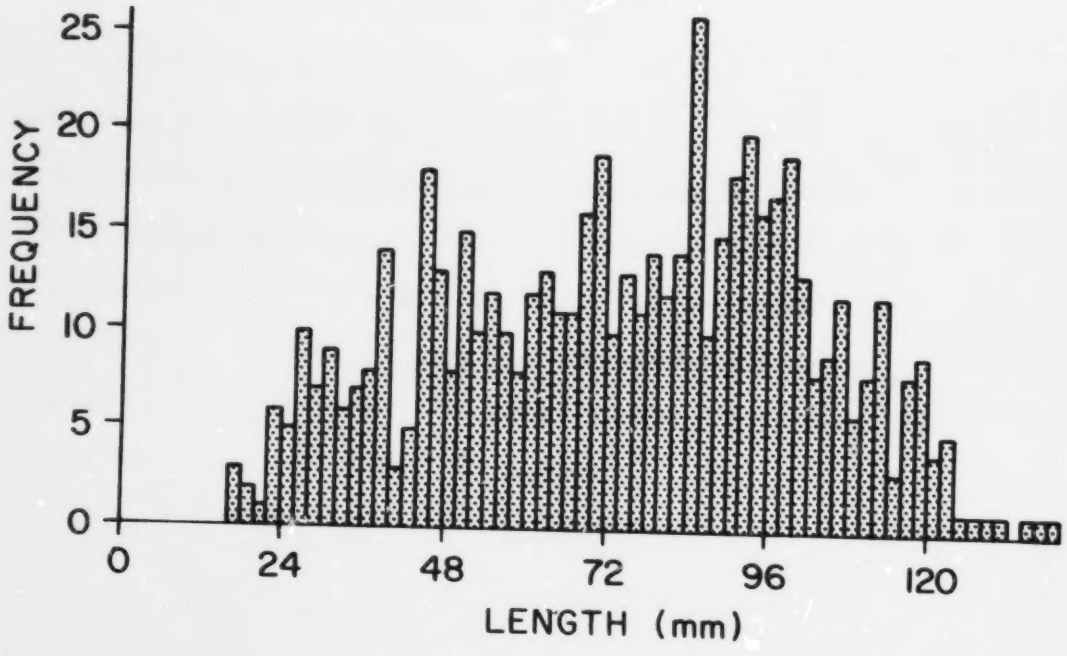
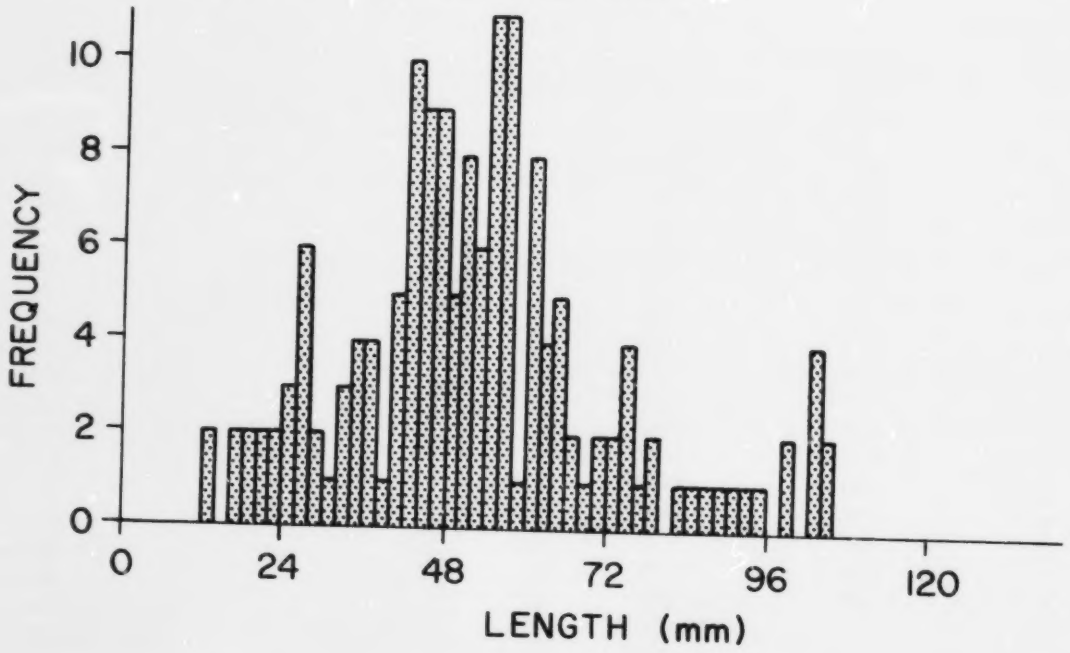


Fig. 3. ABALONE: All areas under rocks



APPENDIX 1

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 001 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 19

LOCATION: Heater Harbour

1984 JUL 12 (PDT) TIME:START: 13:20 FINISH: 14:16

DEPTH FROM DATUM: MAX: 02.2 meters TIDE START: 3.0 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: CBL. SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	90	--	0
BOTTOM	Laminaria sp.	80	--	0
TURF	articulated corallines	20	--	0
ROCKS	Lithothamnion sp.	10	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	006	000	6
ABALONE	.	005	001	000	1
ABALONE	.	006	001	001	0
ABALONE	.	007	002	001	1
ABALONE	.	008	004	001	3
ABALONE	.	009	001	000	1
ABALONE	.	010	000	000	0
ABALONE	.	011	004	000	4
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	001	000	1
SEA URCHIN (RED)	.	016	000	000	0
RED TURBAN SNAIL	.	099	001 *		
		099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 002 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 19

LOCATION: Heater Harbour

1984 JUL 12 (PDT) TIME:START: 13:35 FINISH: 15:22

DEPTH FROM DATUM: MAX: 01.6 meters TIDE START: 3.0 meters

EXPOSURE: Occasional Current SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BLD./CBL./GRV./SHL. SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	40	Macrocystis integrifolia	20
BOTTOM	Laminaria sp.	30	Alaria sp.	10
TURF	articulated corallines	10	--	0
ROCKS	Lithothamnion sp.	50	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	000	1
ABALONE	.	002	006	005	1
ABALONE	.	003	000	000	0
ABALONE	.	004	001	000	1
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	002	000	2
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	001	000	1
ABALONE	.	012	001	000	1
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	001	1
SEA URCHIN (RED)	.	099	005 *		
RED TURBAN SNAIL	.	099	005 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 003 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 19

LOCATION: Heater Harbour

1984 JUL 12 (PDT) TIME:START: 14:37 FINISH: 15:30

DEPTH FROM DATUM: MAX: 01.9 meters TIDE START: 3.3 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: CBL. SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	70	--	0
BOTTOM	Laminaria sp.	50	--	0
TURF	articulated corallines	20	--	0
ROCKS	Lithothamnion sp.	50	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	000	1
ABALONE	.	002	001	000	1
ABALONE	.	003	001	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	001	000	1
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	001	000	1
ABALONE	.	011	002	001	1
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	*		
RED TURBAN SNAIL	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 004 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 19

LOCATION: Heater Harbour

1984 JUL 13 (PDT) TIME:START: 08:47 FINISH: 09:52

DEPTH FROM DATUM: MAX: 03.4 meters TIDE START: 0.3 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BLD./CBL./GRV./SHL. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	50	--	0
BOTTOM	Laminaria sp.	20	Cymathere sp.	10
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	50	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	001	0
ABALONE	.	002	001	001	0
ABALONE	.	003	001	001	0
ABALONE	.	004	001	000	1
ABALONE	.	005	004	003	1
ABALONE	.	006	000	000	0
ABALONE	.	007	005	005	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	007 *		
RED TURBAN SNAIL	.	099	003 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 005 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 19

LOCATION: Luxana Bay

1984 JUL 13 (PDT) TIME:START: 11:27 FINISH: 12:07

DEPTH FROM DATUM: MAX: 09.8 meters TIDE START: 3.0 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BLD. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	10	--	0
BOTTOM	Pterygophora californica	50	Laminaria sp.	30
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	60	--	0

REMARKS: New survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 006 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 19

LOCATION: Luxana Bay

1984 JUL 13 (PDT) TIME:START: 14:07 FINISH: 15:02

DEPTH FROM DATUM: MAX: 07.6 meters TIDE START: 3.2 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./SND./SHL. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	20	--	0
BOTTOM	Pterygophora californica	70	Phyllospadix sp.	10
TURF	articulated corallines	80	Iridaea sp.	10
ROCKS	Lithothamnion sp.	80	--	0

REMARKS: New survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	002	000	2
ABALONE	.	011	001	000	1
ABALONE	.	012	005	000	5
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	*		
RED TURBAN SNAIL	.	099	*		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 007 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 19

LOCATION: Luxana Bay

1984 JUL 13 (PDT) TIME:START: 15:51 FINISH: 16:55

DEPTH FROM DATUM: MAX: 04.2 meters TIDE START: 3.4 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	20	--	0
BOTTOM	Pterygophora californica	30	Laminaria sp.	30
TURF	articulated corallines	40	--	0
ROCKS	Lithothamnion sp.	40	--	0

REMARKS: New survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000		
ABALONE	.	002	001	000	0
ABALONE	.	003	000	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	001	000	0
ABALONE	.	006	000	000	1
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	001	000	0
ABALONE	.	010	000	000	1
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	003 *	000	0
RED TURBAN SNAIL	.	099	*		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 008 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 19

LOCATION: Luxana Bay

1984 JUL 13 (PDT) TIME:START: 14:20 FINISH: 15:05

DEPTH FROM DATUM: MAX: 04.7 meters TIDE START: 3.2 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	10	--	0
BOTTOM	--	0	--	0
TURF	Callophyllis sp.	20	--	0
ROCKS	Lithothamnion sp.	90	--	0

REMARKS: New survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	001	001	0
ABALONE	.	004	000	000	0
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	001	001	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 009 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 19

LOCATION: Luxana Bay

1984 JUL 13 (PDT) TIME:START: 15:29 FINISH: 16:16

DEPTH FROM DATUM: MAX: 03.0 meters TIDE START: 3.4 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	40	--	0
BOTTOM	Laminaria sp.	60	Pterygophora californica	40
TURF	Callophyllis sp.	10	--	0
ROCKS	Lithothamnion sp.	70	--	0

REMARKS: New survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	000	1
ABALONE	.	002	000	000	0
ABALONE	.	003	001	000	1
ABALONE	.	004	001	000	1
ABALONE	.	005	002	001	1
ABALONE	.	006	001	000	1
ABALONE	.	007	000	000	0
ABALONE	.	008	001	000	1
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	001	000	1
SEA URCHIN (RED)	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 010 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 14 (PDT) TIME:START: 09:15 FINISH: 09:40

DEPTH FROM DATUM: MAX: 02.6 meters TIDE START: 0.5 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BLD. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	--	0	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	20	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	002	000	2
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	003	000	3
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	001	001	0
ABALONE	.	011	000	000	0
ABALONE	.	012	001	000	1
ABALONE	.	013	000	000	0
ABALONE	.	014	001	000	1
ABALONE	.	015	001	000	1
ABALONE	.	016	003	000	3
SEA URCHIN (RED)	.	099	*		
RED TURBAN SNAIL	.	099	*		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 011 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 14 (PDT) TIME:START: 10:11 FINISH: 10:31

DEPTH FROM DATUM: MAX: 02.1 meters TIDE START: 0.7 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BLD. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	--	0	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	10	--	0

REMARKS: Aborted - Target Species Absent

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
SEA URCHIN (RED)	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 012 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 14 (PDT) TIME:START: 13:38 FINISH: 14:36

DEPTH FROM DATUM: MAX: 01.8 meters TIDE START: 3.4 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BLD. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	60	--	0
BOTTOM	--	0	Laminaria sp.	10
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	10	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	001	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	001	000	1
ABALONE	.	008	000	000	0
ABALONE	.	009	001	000	1
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	*		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 013 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 14 (PDT) TIME:START: 09:45 FINISH: 10:26

DEPTH FROM DATUM: MAX: 02.0 meters TIDE START: 0.5 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	50	--	0
BOTTOM	Laminaria sp.	20	Desmarestia sp.	20
TURF	Calliarthron sp.	20	--	0
ROCKS	Hildenbrandia sp.	40	Lithothamnion sp.	20

REMARKS: Aborted - Bad Diving Conditions

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	002	000	2
ABALONE	.	009	002	000	2
ABALONE	.	010	000	000	0
ABALONE	.	011	001	000	1
ABALONE	.	012	000	000	0
SEA URCHIN (RED)	.	099	005 *		
RED TURBAN SNAIL	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 014 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 14 (PDT) TIME:START: 13:00 FINISH: 14:17

DEPTH FROM DATUM: MAX: 02.7 meters TIDE START: 2.8 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	60	--	0
BOTTOM	Cymathere sp.	30	Laminaria sp.	10
TURF	articulated corallines	20	Callophyllis sp.	10
ROCKS	Lithothamnion sp.	40	Hildenbrandia sp.	30

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	001	000	1
ABALONE	.	003	001	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	002	000	2
ABALONE	.	006	001	000	1
ABALONE	.	007	001	000	1
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	001	000	1
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	003	001	2
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	005 *		
RED TURBAN SNAIL	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 015 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 14 (PDT) TIME:START: 15:18 FINISH: 16:20

DEPTH FROM DATUM: MAX: 00.6 meters TIDE START: 3.9 meters

EXPOSURE: Occasional Current SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 40 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	10	--	0
BOTTOM	Pterygophora californica	10	Laminaria sp.	30
TURF	articulated corallines	40	--	0
ROCKS	--	0	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	001	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	001	000	1
ABALONE	.	007	002	000	2
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	002	000	2
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	001	000	1
ABALONE	.	015	000	000	0
ABALONE	.	016	001	000	1
SEA URCHIN (RED)	.	099	003 *		
RED TURBAN SNAIL	.	099	*		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 016 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 15 (PDT) TIME:START: 10:01 FINISH: 11:15

DEPTH FROM DATUM: MAX: 03.2 meters TIDE START: 0.5 meters

EXPOSURE: Moderate Exposure SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./CBL. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	30	Macrocystis integrifolia	10
BOTTOM	--	0	--	0
TURF	--	0	--	0
ROCKS	--	0	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	001	001	0
ABALONE	.	005	001	001	0
ABALONE	.	006	004	004	0
ABALONE	.	007	000	000	0
ABALONE	.	008	002	002	0
ABALONE	.	009	000	000	0
ABALONE	.	010	001	000	1
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	007	007	0
ABALONE	.	014	002	002	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	005 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 017 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 15 (PDT) TIME:START: 12:10 FINISH: 12:50

DEPTH FROM DATUM: MAX: 03.1 meters TIDE START: 1.2 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 40 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	Laminaria sp.	10	Phyllospadix sp.	10
TURF	articulated corallines	10	--	0
ROCKS	Lithothamnion sp.	50	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	000	1
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 018 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 15 (PDT) TIME:START: 14:57 FINISH: 15:17

DEPTH FROM DATUM: MAX: 01.1 meters TIDE START: 3.2 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	80	--	0
BOTTOM	Cymathere sp.	30	Laminaria sp.	50
TURF	Corallina sp.	60	Bossiella sp.	40
ROCKS	Lithothamnion sp.	60	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	001	000	1
ABALONE	.	003	001	000	1
ABALONE	.	004	001	000	1
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	002	000	2
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	001	000	1
ABALONE	.	011	000	000	0
ABALONE	.	012	002	000	2
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	004	000	4
ABALONE	.	016	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 019 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 17

LOCATION: Carpenter Bay

1984 JUL 15 (PDT) TIME:START: 16:35 FINISH: 17:35

DEPTH FROM DATUM: MAX: 01.0 meters TIDE START: 3.9 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 40 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Hedophyllum sessile	50	Laminaria sp.	40
BOTTOM	Gigartina sp.	20	Rhodymenia sp.	30
TURF	Codium fragile	60	Iridaea sp.	20
ROCKS	Codium setchellii	20	Lithothamnion sp.	30

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	001	001	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	001	001	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 020 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Copper Islands

1984 JUL 16 (PDT) TIME:START: 08:45 FINISH: 09:20

DEPTH FROM DATUM: MAX: 00.5 meters TIDE START: 1.3 meters

EXPOSURE: Occasional Current SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Egregia menziesii	10	--	0
BOTTOM	Desmarestia sp.	20	Desmarestia sp.	10
TURF	articulated corallines	20	--	0
ROCKS	Lithothamnion sp.	70	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	005	000	5
ABALONE	.	002	001	000	1
ABALONE	.	003	002	000	2
ABALONE	.	004	003	000	3
ABALONE	.	005	000	000	0
ABALONE	.	006	005	000	5
ABALONE	.	007	001	000	1
ABALONE	.	008	003	000	3
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	003	000	3
ABALONE	.	012	001	000	1
ABALONE	.	013	000	000	0
ABALONE	.	014	001	000	1
ABALONE	.	015	000	000	0
ABALONE	.	016	001	000	1
SEA URCHIN (RED)	.	099	003 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 021 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Copper Islands

1984 JUL 16 (PDT) TIME:START: 09:40 FINISH: 09:55

DEPTH FROM DATUM: MAX: 03.2 meters TIDE START: 0.8 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	10	--	0
BOTTOM	Desmarestia sp.	20	--	0
TURF	articulated corallines	10	--	0
ROCKS	Lithothamnion sp.	70	--	0

REMARKS: Aborted - Target Species Absent

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 022 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Skincuttle Inlet

1984 JUL 16 (PDT) TIME:START: 11:00 FINISH: 12:15

DEPTH FROM DATUM: MAX: 02.4 meters TIDE START: 0.6 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	20	--	0
BOTTOM	Pterygophora californica	30	Desmarestia sp.	10
TURF	articulated corallines	10	--	0
ROCKS	Lithothamnion sp.	50	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	002	002	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	001	000	1
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	020 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 023 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Skincuttle Inlet

1984 JUL 16 (PDT) TIME:START: 13:36 FINISH: 14:36

DEPTH FROM DATUM: MAX: 00.5 meters TIDE START: 2.6 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BLD. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	20	Nereocystis luetkeana	20
BOTTOM	Cymathere sp.	40	Laminaria sp.	10
TURF	articulated corallines	10	Ulva sp.	10
ROCKS	Lithothamnion sp.	20	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	006	004	2
ABALONE	.	002	001	000	1
ABALONE	.	003	000	000	0
ABALONE	.	004	002	001	1
ABALONE	.	005	000	000	0
ABALONE	.	006	001	000	1
ABALONE	.	007	000	000	0
ABALONE	.	008	001	000	1
ABALONE	.	009	001	000	1
ABALONE	.	010	001	001	0
ABALONE	.	011	001	001	0
ABALONE	.	012	001	000	1
ABALONE	.	013	000	000	0
ABALONE	.	014	002	000	2
ABALONE	.	015	001	000	1
ABALONE	.	016	001	001	0
SEA URCHIN (RED)	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 024 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Skincuttle Inlet

1984 JUL 14 (PDT) TIME:START: 09:25 FINISH: 09:53

DEPTH FROM DATUM: MAX: 02.3 meters TIDE START: 1.1 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	Desmarestia sp.	10	--	0
TURF	Codium fragile	10	--	0
ROCKS	articulated corallines	10	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	002	000	2
ABALONE	.	003	005	000	5
ABALONE	.	004	000	000	0
ABALONE	.	005	001	000	1
ABALONE	.	006	001	000	1
ABALONE	.	007	001	000	1
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	001	000	1
ABALONE	.	014	002	000	2
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	002 *		
RED TURBAN SNAIL	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 025 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Skincuttle Inlet

1984 JUL 17 (PDT) TIME:START: 10:45 FINISH: 11:15

DEPTH FROM DATUM: MAX: 03.0 meters TIDE START: 1.0 meters

EXPOSURE: Moderate Exposure SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD./CBL. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	30	Nereocystis luetkeana	10
BOTTOM	Laminaria sp.	80	Cymathere sp.	10
TURF	articulated corallines	20	--	0
ROCKS	Lithothamnion sp.	20	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	001	0
ABALONE	.	002	002	001	1
ABALONE	.	003	000	000	0
ABALONE	.	004	001	001	0
ABALONE	.	005	001	001	0
ABALONE	.	006	000	000	0
ABALONE	.	007	003	002	1
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	003	000	3
ABALONE	.	011	000	000	0
ABALONE	.	012	002	000	2
ABALONE	.	013	000	000	0
ABALONE	.	014	004	000	4
ABALONE	.	015	001	000	1
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 026 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Skincuttle Inlet

1984 JUL 17 (PDT) TIME:START: 14:25 FINISH: 15:41

DEPTH FROM DATUM: MAX: 00.8 meters TIDE START: 3.2 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 40 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	Codium fragile	20	Monostroma sp.	10
TURF	articulated corallines	10	--	0
ROCKS	Lithothamnion sp.	10	--	0

REMARKS: New survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	005	000	5
ABALONE	.	003	003	000	3
ABALONE	.	004	000	000	0
ABALONE	.	005	001	001	0
ABALONE	.	006	004	002	2
ABALONE	.	007	006	000	6
ABALONE	.	008	004	003	1
ABALONE	.	009	000	000	0
ABALONE	.	010	003	000	3
ABALONE	.	011	000	000	0
ABALONE	.	012	003	001	2
ABALONE	.	013	006	001	5
ABALONE	.	014	003	002	1
ABALONE	.	015	003	000	3
ABALONE	.	016	002	001	1
SEA URCHIN (RED)	.	099	001 *		
RED TURBAN SNAIL	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 027 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Skincuttle Inlet

1984 JUL 17 (PDT) TIME:START: 16:20 FINISH: 17:17

DEPTH FROM DATUM: MAX: 00.5 meters TIDE START: 4.6 meters

EXPOSURE: Moderate Exposure SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD./CBL. SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	80	--	0
BOTTOM	Agarum sp.	90	--	0
TURF	articulated corallines	10	--	0
ROCKS	Lithothamnion sp.	50	Hildenbrandia sp.	50

REMARKS: Aborted - Target Species Absent

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 028 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Skincuttle Inlet

1984 JUL 18 (PDT) TIME:START: 08:40 FINISH: 09:20

DEPTH FROM DATUM: MAX: 02.3 meters TIDE START: 2.3 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 40 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	10	Egregia menziesii	10
BOTTOM	Desmarestia sp.	20	--	0
TURF	--	0	--	0
ROCKS	--	0	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	002	000	2
ABALONE	.	003	001	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	006	000	6
ABALONE	.	015	009	000	9
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	025 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 029 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Copper Islands

1984 JUL 18 (PDT) TIME:START: 10:10 FINISH: 10:32

DEPTH FROM DATUM: MAX: 01.6 meters TIDE START: 1.5 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	10	--	0
BOTTOM	Desmarestia sp.	10	--	0
TURF	--	0	--	0
ROCKS	--	0	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	002	000	2
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	001	000	1
ABALONE	.	010	002	000	2
ABALONE	.	011	002	000	2
ABALONE	.	012	000	000	0
ABALONE	.	013	003	000	3
ABALONE	.	014	001	000	1
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	010 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 030 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 14

LOCATION: Copper Islands

1984 JUL 18 (PDT) TIME:START: 10:40 FINISH: 11:30

DEPTH FROM DATUM: MAX: 01.8 meters TIDE START: 1.2 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	--	0	--	0
TURF	Phyllospadix sp.	30	--	0
ROCKS	Lithothamnion sp.	90	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	001	000	1
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	004	000	4
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	002	000	2
ABALONE	.	013	001	000	1
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	012	000	12
SEA URCHIN (RED)	.	099	025 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 031 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 14

LOCATION: Poole Inlet

1984 JUL 18 (PDT) TIME:START: 13:05 FINISH: 13:48

DEPTH FROM DATUM: MAX: 01.7 meters TIDE START: 1.3 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: CBL. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	60	--	0
BOTTOM	Laminaria sp.	60	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	30	articulated corallines	30

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	002	000	2
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	005	000	5
ABALONE	.	007	002	001	1
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	010 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 032 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 14

LOCATION: Poole Inlet

1984 JUL 18 (PDT) TIME:START: 14:10 FINISH: 14:32

DEPTH FROM DATUM: MAX: 05.4 meters TIDE START: 1.9 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	40	--	0
BOTTOM	Desmarestia sp.	30	--	0
TURF	--	0	--	0
ROCKS	articulated corallines	30	Lithothamnion sp.	40

REMARKS: Aborted - Target Species Absent

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
SEA URCHIN (RED)	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 033 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 15

LOCATION: Swan Bay

1984 JUL 18 (PDT) TIME:START: 09:05 FINISH: 10:25

DEPTH FROM DATUM: MAX: 02.2 meters TIDE START: 2.0 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD./CBL. SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	50	--	0
BOTTOM	Cymathere sp.	60	Costaria sp.	20
TURF	articulated corallines	10	--	0
ROCKS	--	0	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	004	002	2
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	003	001	2
ABALONE	.	008	003	000	3
ABALONE	.	009	001	000	1
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	001	000	1
ABALONE	.	013	003	000	3
ABALONE	.	014	001	000	1
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	005 *		
RED TURBAN SNAIL	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 034 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 14

LOCATION: Poole Inlet

1984 JUL 18 (PDT) TIME:START: 10:51 FINISH: 11:58

DEPTH FROM DATUM: MAX: 03.1 meters TIDE START: 1.2 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD./CBL. SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	60	--	0
BOTTOM	Cymathere sp.	80	Agarum sp.	10
TURF	articulated corallines	10	--	0
ROCKS	Hildenbrandia sp.	10	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	003	000	3
ABALONE	.	003	001	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	002	000	2
ABALONE	.	006	003	000	3
ABALONE	.	007	001	000	1
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	001	000	1
ABALONE	.	011	003	000	3
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	001	000	1
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	003 *		
RED TURBAN SNAIL	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 035 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 14

LOCATION: Poole Inlet

1984 JUL 18 (PDT) TIME:START: 13:31 FINISH: 14:59

DEPTH FROM DATUM: MAX: 02.0 meters TIDE START: 1.6 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD./CBL. SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	80	--	0
BOTTOM	Cymathere sp.	80	Agarum sp.	10
TURF	Callophyllis sp.	20	--	0
ROCKS	--	0	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	001	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	002	000	2
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	001	000	1
ABALONE	.	010	003	001	2
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	002 *		
RED TURBAN SNAIL	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 036 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 12

LOCATION: Werner Bay

1984 JUL 19 (PDT) TIME:START: 09:41 FINISH: 10:17

DEPTH FROM DATUM: MAX: 02.0 meters TIDE START: 2.6 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 80 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	10	--	0
BOTTOM	Pterygophora californica	70	Egregia menziesii	10
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	20	--	0

REMARKS: Aborted - Target Species Absent

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 037 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Hutton Inlet

1984 JUL 19 (PDT) TIME:START: 10:34 FINISH: 11:16

DEPTH FROM DATUM: MAX: 00.9 meters TIDE START: 2.2 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	30	--	0
BOTTOM	Laminaria sp.	80	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	40	--	0

REMARKS: Aborted - Target Species Absent

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	00C	000	0
ABALONE	.	008	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 038 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Hutton Inlet

1984 JUL 19 (PDT) TIME:START: 14:10 FINISH: 15:30

DEPTH FROM DATUM: MAX: 00.9 meters TIDE START: 1.6 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	Costaria sp.	80	Laminaria sp.	20
TURF	Desmarestia sp.	20	Egregia menziesii	10
ROCKS	Hildenbrandia sp.	10	Lithothamnion sp.	10

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	002	000	2
ABALONE	.	002	001	001	0
ABALONE	.	003	000	000	0
ABALONE	.	004	002	002	0
ABALONE	.	005	003	000	3
ABALONE	.	006	001	000	1
ABALONE	.	007	003	000	3
ABALONE	.	008	007	007	0
ABALONE	.	009	010	006	4
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	001	000	1
ABALONE	.	013	000	000	0
ABALONE	.	014	002	000	2
ABALONE	.	015	002	002	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 039 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: De La Beche Inlet

1984 JUL 19 (PDT) TIME:START: 15:50 FINISH: 17:00

DEPTH FROM DATUM: MAX: 02.9 meters TIDE START: 2.6 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 60 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	80	--	0
BOTTOM	Pterygophora californica	80	Laminaria sp.	10
TURF	articulated corallines	90	--	0
ROCKS	Lithothamnion sp.	20	Hildenbrandia sp.	20

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	005	000	5
ABALONE	.	002	005	000	5
ABALONE	.	003	002	000	2
ABALONE	.	004	002	000	2
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	003	000	3
ABALONE	.	009	002	000	2
ABALONE	.	010	000	000	0
ABALONE	.	011	001	000	1
ABALONE	.	012	003	000	3
ABALONE	.	013	002	000	2
ABALONE	.	014	000	000	0
ABALONE	.	015	001	000	1
ABALONE	.	016	002	000	2
SEA URCHIN (RED)	.	099	*		
RED TURBAN SNAIL	.	099	*		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 040 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: De La Beche Inlet

1984 JUL 20 (PDT) TIME:START: 09:50 FINISH: 10:27

DEPTH FROM DATUM: MAX: 01.4 meters TIDE START: 3.5 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	Desmarestia sp.	20	--	0
TURF	articulated corallines	10	Codium fragil	10
ROCKS	Lithothamnion sp.	20	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	001	000	1
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 041 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: De La Beche Inlet

1984 JUL 20 (PDT) TIME:START: 10:53 FINISH: 11:35

DEPTH FROM DATUM: MAX: 03.4 meters TIDE START: 2.4 meters

EXPOSURE: Moderate Exposure SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 40 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	--	0	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	40	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	001	001	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	001	000	1
ABALONE	.	008	000	000	0
ABALONE	.	009	001	001	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	*		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 042 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 12

LOCATION: Werner Bay

1984 JUL 20 (PDT) TIME:START: 13:40 FINISH: 14:36

DEPTH FROM DATUM: MAX: 02.6 meters TIDE START: 1.7 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	Pterygophora californica	70	Desmarestia sp.	20
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	60	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	001	000	1
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	010 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 043 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 12

LOCATION: Werner Bay

1984 JUL 20 (PDT) TIME:START: 14:53 FINISH: 15:47

DEPTH FROM DATUM: MAX: 02.0 meters TIDE START: 2.0 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	10	Egregia menziesii	10
BOTTOM	Pterygophora californica	70	Alaria sp.	20
TURF	articulated corallines	40	--	0
ROCKS	Lithothamnion sp.	0	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	001	000	1
ABALONE	.	004	001	000	1
ABALONE	.	005	001	000	1
ABALONE	.	006	001	000	1
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	001	000	1
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	C00	0
ABALONE	.	016	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 044 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Bishof Islands

1984 JUL 20 (PDT) TIME:START: 09:32 FINISH: 10:20

DEPTH FROM DATUM: MAX: 00.8 meters TIDE START: 3.2 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 70 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	Codium fragile	40	Ulva sp.	60
TURF	Ceramium sp.	40	Leathesia difformis	10
ROCKS	Hildenbrandia sp.	20	Codium setchellii	10

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	003	002	1
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	001	000	1
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	001 *		
RED TURBAN SNAIL	.	099	*		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 045 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Bishof Islands

1984 JUL 20 (PDT) TIME:START: 10:54 FINISH: 11:40

DEPTH FROM DATUM: MAX: 01.3 meters TIDE START: 2.4 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 70 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	10	--	0
BOTTOM	--	0	--	0
TURF	articulated corallines	10	--	0
ROCKS	--	0	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	002	000	2
ABALONE	.	005	001	000	1
ABALONE	.	006	001	000	1
ABALONE	.	007	005	000	5
ABALONE	.	008	000	000	0
ABALONE	.	009	002	000	2
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	001	000	1
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
RED TURBAN SNAIL	.	099	001 *		
SEA URCHIN (RED)	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 045 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Ramsay Passage

1984 JUL 21 (PDT) TIME:START: 09:18 FINISH: 10:12

DEPTH FROM DATUM: MAX: 02.9 meters TIDE START: 3.2 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 40 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	40	--	0
BOTTOM	Desmarestia sp.	20	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	50	articulated corallines	30

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	001	000	1
ABALONE	.	014	001	000	1
ABALONE	.	015	005	000	5
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	015 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 047 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Ramsay Passage

1984 JUL 21 (PDT) TIME:START: 10:57 FINISH: 11:55

DEPTH FROM DATUM: MAX: 00.7 meters TIDE START: 2.3 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 00 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	70	--	0
BOTTOM	Pterygophora californica	90	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	50	--	0

REMARKS: Aborted - Target Species Absent

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 048 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Ramsay Passage

1984 JUL 21 (PDT) TIME:START: 09:15 FINISH: 10:15

DEPTH FROM DATUM: MAX: 00.5 meters TIDE START: 3.2 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	20	Nereocystis luetkeana	10
BOTTOM	Costaria sp.	30	Laminaria sp.	40
TURF	articulated corallines	20	--	0
ROCKS	Lithothamnion sp.	50	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	003	000	3
ABALONE	.	002	000	000	0
ABALONE	.	003	001	000	1
ABALONE	.	004	001	000	1
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	003	000	3
ABALONE	.	012	004	000	4
ABALONE	.	013	000	000	0
ABALONE	.	014	001	000	1
ABALONE	.	015	006	000	6
ABALONE	.	016	000	000	0
RED TURBAN SNAIL	.	099	002 *		
SEA URCHIN (RED)	.	099	015 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 049 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Ramsay Passage

1984 JUL 21 (PDT) TIME:START: 10:49 FINISH: 11:30

DEPTH FROM DATUM: MAX: 01.3 meters TIDE START: 2.4 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	10	--	0
BOTTOM	Gigartina sp.	40	--	10
TURF	Leathesia difformis	60	articulated corallines	20
ROCKS	Diatoms - unknown	80	Lithothaminion sp.	10

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	002	000	2
ABALONE	.	010	002	000	2
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	003	000	3
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	002	000	2
RED TURBAN SNAIL	.	099	003 *		
SEA URCHIN (RED)	.	099	005 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 050 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Faraday Passage

1984 JUL 21 (PDT) TIME:START: 14:35 FINISH: 15:35

DEPTH FROM DATUM: MAX: 00.7 meters TIDE START: 2.0 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BLD./CBL./GRV./SHL. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	50	--	0
BOTTOM	--	0	--	0
TURF	articulated corallines	50	--	0
ROCKS	Lithothamnion sp.	30	Hildenbrandia sp.	10

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	004	002	2
ABALONE	.	003	001	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	001	000	1
ABALONE	.	008	002	000	2
ABALONE	.	009	000	000	0
ABALONE	.	010	001	000	1
ABALONE	.	011	004	000	4
ABALONE	.	012	004	000	4
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	001	001	0
ABALONE	.	016	003	000	3
RED TURBAN SNAIL	.	099	003 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 051 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Gogit Passage

1984 JUL 21 (PDT) TIME:START: 16:20 FINISH: 17:01

DEPTH FROM DATUM: MAX: 01.6 meters TIDE START: 3.0 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BLD./CBL./GRV./SHL. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	Laminaria sp.	40	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	30	Diatoms - unknown	80

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	001	001	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 052 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Ramsay Passage

1984 JUL 22 (PDT) TIME:START: 09:22 FINISH: 10:20

DEPTH FROM DATUM: MAX: 03.7 meters TIDE START: 3.3 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 70 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	10	--	0
BOTTOM	Desmarestia sp.	20	Costaria sp.	10
TURF	articulated corallines	30	--	0
ROCKS	Lithothamnion sp.	40	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	003	000	3
ABALONE	.	002	004	000	4
ABALONE	.	003	001	000	1
ABALONE	.	004	001	000	1
ABALONE	.	005	000	000	0
ABALONE	.	006	004	000	4
ABALONE	.	007	004	000	4
ABALONE	.	008	002	000	2
ABALONE	.	009	002	000	2
ABALONE	.	010	003	000	3
ABALONE	.	011	000	000	0
ABALONE	.	012	001	001	0
ABALONE	.	013	000	000	0
ABALONE	.	014	002	000	2
ABALONE	.	015	000	000	0
ABALONE	.	016	007	001	6
SEA URCHIN (RED)	.	099	005 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 053 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Gogit Passage

1984 JUL 22 (PDT) TIME:START: 11:47 FINISH: 12:51

DEPTH FROM DATUM: MAX: 05.7 meters TIDE START: 2.9 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 80 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	20	--	0
BOTTOM	Laminaria sp.	30	Desmarestia sp.	20
TURF	articulated corallines	20	--	0
ROCKS	--	0	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	000	1
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	001	000	1
ABALONE	.	011	001	000	1
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	001	000	1
ABALONE	.	016	000	000	0

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 054 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Faraday Passage

1984 JUL 22 (PDT) TIME:START: 10:12 FINISH: 10:36

DEPTH FROM DATUM: MAX: 03.8 meters TIDE START: 3.2 meters

EXPOSURE: Occasional Current SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 80 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	--	0	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	40	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	002	000	2
ABALONE	.	002	001	000	1
ABALONE	.	003	003	000	3
ABALONE	.	004	000	000	0
ABALONE	.	005	002	000	2
ABALONE	.	006	001	000	1
ABALONE	.	007	003	000	3
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	003	000	3
ABALONE	.	015	001	001	0
ABALONE	.	016	001	000	1
SEA URCHIN (RED)	.	099	003 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 055 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Gogit Passage

1984 JUL 22 (PDT) TIME:START: 11:33 FINISH: 12:14

DEPTH FROM DATUM: MAX: 02.6 meters TIDE START: 2.9 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPF: BRK./BLD. SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	20	--	0
BOTTOM	Pterygophora californica	10	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	70	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	002	000	2
ABALONE	.	002	002	000	2
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	001	000	1
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	002	000	2
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	003	000	3
ABALONE	.	014	001	000	1
ABALONE	.	015	003	000	3
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	004 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 056 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Gogit Passage

1984 JUL 22 (PDT) TIME:START: 12:23 FINISH: 12:54

DEPTH FROM DATUM: MAX: 03.2 meters TIDE START: 2.6 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	20	--	0
BOTTOM	--	0	--	0
TURF	Desmarestia sp.	20	--	0
ROCKS	Lithothamnion sp.	70	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	001	000	1
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	003	001	2
ABALONE	.	008	003	000	3
ABALONE	.	009	010	000	10
ABALONE	.	010	000	000	0
ABALONE	.	011	002	000	2
ABALONE	.	012	002	000	2
ABALONE	.	013	001	000	1
ABALONE	.	014	001	000	1
ABALONE	.	015	004	000	4
ABALONE	.	016	002	000	2
SEA URCHIN (RED)	.	099	004 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 057 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Gogit Passage

1984 JUL 22 (PDT) TIME:START: 14:50 FINISH: 15:56

DEPTH FROM DATUM: MAX: 00.6 meters TIDE START: 2.1 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	80	--	0
BOTTOM	Costaria sp.	40	Laminaria sp.	40
TURF	articulated corallines	90	--	0
ROCKS	Lithothamnion sp. H sp.	50	Hildenbrandia sp.	20

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	002	000	2
ABALONE	.	002	003	000	3
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	002	000	2
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	007	000	7
ABALONE	.	016	001	000	1

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 058 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 11

LOCATION: Gogit Passage

1984 JUL 22 (PDT) TIME:START: 16:14 FINISH: 17:13

DEPTH FROM DATUM: MAX: 01.3 meters TIDE START: 2.3 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	80	--	0
BOTTOM	Laminaria sp.	50	Desmarestia sp.	30
TURF	articulated corallines	60	--	0
ROCKS	Lithothamnion sp.	40	Codium setchellii	10

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	007	006	1
ABALONE	.	009	001	001	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	001	001	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	001	001	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 059 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 08

LOCATION: Kunga Island

1984 JUL 23 (PDT) TIME:START: 09:23 FINISH: 09:55

DEPTH FROM DATUM: MAX: 03.8 meters TIDE START: 3.8 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	20	Nereocystis luetkeana	20
BOTTOM	Desmarestia sp.	20	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	80	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	002	000	2
ABALONE	.	002	001	000	1
ABALONE	.	003	003	000	3
ABALONE	.	004	001	000	1
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	002	000	2
ABALONE	.	008	002	000	2
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	002	000	2
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	003 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 060 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 08

LOCATION: Kunga Island

1984 JUL 23 (PDT) TIME:START: 10:36 FINISH: 11:38

DEPTH FROM DATUM: MAX: 00.0 meters TIDE START: 4.1 meters

EXPOSURE: Ground Swell Normal SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	80	--	0
BOTTOM	Laminaria sp.	40	--	0
TURF	--	0	articulated corallines	10
ROCKS	Lithothamnion sp.	70	--	0

REMARKS: New survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	002	000	2
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	001	000	1
ABALONE	.	009	000	000	0
ABALONE	.	010	001	000	1
ABALONE	.	011	007	001	6
ABALONE	.	012	001	000	1
ABALONE	.	013	000	000	0
ABALONE	.	014	002	000	2
ABALONE	.	015	007	000	7
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	004 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 061 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 08

LOCATION: Tanu Island

1984 JUL 23 (PDT) TIME:START: 13:45 FINISH: 14:50

DEPTH FROM DATUM: MAX: 01.1 meters TIDE START: 2.9 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./GRV. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	Costaria sp.	70	Laminaria sp.	20
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	20	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	003	000	3
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	001	000	1
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	001	000	1
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 062 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 08

LOCATION: Lyell Island

1984 JUL 23 (PDT) TIME:START: 09:30 FINISH: 10:15

DEPTH FROM DATUM: MAX: 00.2 meters TIDE START: 3.8 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD./CBL. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME		%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--		0	--	0
BOTTOM	Cymathere sp.		60	Costaria sp.	10
TURF	articulated corallines		10	--	0
ROCKS	Lithothamnion sp.	H sp.	30	Hildenbrandia sp.	10

REMARKS: New survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	000	1
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	001	000	1
ABALONE	.	005	002	000	2
ABALONE	.	006	002	000	2
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	002	000	2
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	001	000	1
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
RED TURBAN SNAIL	.	099	001 *		
SEA URCHIN (RED)	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 063 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 08

LOCATION: Kunga Island

1984 JUL 23 (PDT) TIME:START: 10:57 FINISH: 12:16

DEPTH FROM DATUM: MAX: 00.5 meters TIDE START: 4.1 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD./CBL. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	20	--	0
BOTTOM	Cymathere sp.	40	Laminaria sp.	40
TURF	articulated corallines	10	--	0
ROCKS	Lithothamnion sp.	50	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	003	002	1
ABALONE	.	002	004	003	1
ABALONE	.	003	002	002	0
ABALONE	.	004	002	002	0
ABALONE	.	005	001	001	0
ABALONE	.	006	002	002	0
ABALONE	.	007	005	005	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	009	008	1
ABALONE	.	011	002	002	0
ABALONE	.	012	001	001	0
ABALONE	.	013	001	001	0
ABALONE	.	014	000	000	0
ABALONE	.	015	005	005	0
ABALONE	.	016	001	001	0
SEA URCHIN (RED)	.	099	001 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 064 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 08

LOCATION: Kunga Island

1984 JUL 23 (PDT) TIME:START: 14:23 FINISH: 15:30

DEPTH FROM DATUM: MAX: 00.1 meters TIDE START: 2.9 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 10 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	50	Macrocystis integrifolia	30
BOTTOM	Costaria sp.	20	Laminaria sp.	40
TURF	articulated corallines	20	--	0
ROCKS	Lithothamnion sp.	70	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	000	1
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
RED TURBAN SNAIL	.	099	005 *		
SEA URCHIN (RED)	.	99	003 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 065 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 07

LOCATION: Vertical Pt.

1984 JUL 24 (PDT) TIME:START: 09:16 FINISH: 09:57

DEPTH FROM DATUM: MAX: 04.3 meters TIDE START: 3.3 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	--	0	--	0
BOTTOM	--	0	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	50	--	0

REMARKS:

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	001	000	1
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	001	000	1
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	003 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 066 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 07

LOCATION: Vertical Pt.

1984 JUL 24 (PDT) TIME:START: 10:18 FINISH: 11:20

DEPTH FROM DATUM: MAX: 00.9 meters TIDE START: 4.0 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Macrocystis integrifolia	70	--	0
BOTTOM	Laminaria sp.	60	--	0
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	60	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	002	000	2
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	005 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 067 DIVER: OOK

FISHERIES STATISTICAL: region 0 area 02 sub-area 07

LOCATION: Limestone Islands

1984 JUL 25 (PDT) TIME:START: 13:25 FINISH: 14:00

DEPTH FROM DATUM: MAX: 02.1 meters TIDE START: 4.0 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 20 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	70	--	0
BOTTOM	Laminaria sp.	60	Costaria sp.	10
TURF	--	0	--	0
ROCKS	Lithothamnion sp.	40	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
SEA URCHIN (RED)	.	099	005 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 068 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 07

LOCATION: Breaker Bay

1984 JUL 24 (PDT) TIME:START: 09:30 FINISH: 10:15

DEPTH FROM DATUM: MAX: 03.4 meters TIDE START: 3.3 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(CRV) SLOPE: 60 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	80	--	0
BOTTOM	Alaria sp.	40	Costaria sp.	20
TURF	Laminaria sp.	30	Desmarestia sp.	10
ROCKS	Lithothamnion sp.	80	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	001	000	1
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	001	000	1
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	001	000	1
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 069 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 07

LOCATION: Breaker Bay

1984 JUL 24 (PDT) TIME:START: 10:36 FINISH: 11:21

DEPTH FROM DATUM: MAX: 01.5 meters TIDE START: 4.0 meters

EXPOSURE: Strong Tidal Flows SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK./BLD. SLOPE: 30 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	30	--	0
BOTTOM	Costaria sp.	20	Alaria sp.	20
TURF	Desmarestia sp.	0	articulated corallines	30
ROCKS	Lithothamnion sp.	40	Codium setchellii	10

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	000	000	0
ABALONE	.	002	000	000	0
ABALONE	.	003	001	001	0
ABALONE	.	004	000	000	0
ABALONE	.	005	000	000	0
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	000	000	0
ABALONE	.	014	000	000	0
ABALONE	.	015	000	000	0
ABALONE	.	016	001	000	1
SEA URCHIN (RED)	.	099	002 *		

DIVING STATION LOG

ABALONE RESURVEY
QUEEN CHARLOTTE ISLANDS

VESSEL: Beowulf SITE: 070 DIVER: OOW

FISHERIES STATISTICAL: region 0 area 02 sub-area 07

LOCATION: Limestone Islands

1984 JUL 24 (PDT) TIME:START: 12:57 FINISH: 13:40

DEPTH FROM DATUM: MAX: 03.9 meters TIDE START: 4.0 meters

EXPOSURE: High Tide Surge Only SURVEY DESIGN: 16 quadrats

SUBSTRATE TYPE: BRK.(SMO) SLOPE: 60 degrees

	DOMINANT ALGAE SPECIES NAME	%COVER UP TO	SPECIES NAME	%COVER UP TO
CANOPY	Nereocystis luetkeana	60	--	0
BOTTOM	Alaria sp.	40	Costaria sp.	20
TURF	Laminaria sp.	40	--	0
ROCKS	Lithothamnion sp.	40	--	0

REMARKS: previous survey site

SPECIES NAME	DEPTH FROM DATUM	QUADRAT NUMBER	TOTAL SPECIES COUNT	COUNT UNDER ROCKS	COUNT ON ROCKS
ABALONE	.	001	001	000	1
ABALONE	.	002	001	000	1
ABALONE	.	003	000	000	0
ABALONE	.	004	000	000	0
ABALONE	.	005	001	000	1
ABALONE	.	006	000	000	0
ABALONE	.	007	000	000	0
ABALONE	.	008	000	000	0
ABALONE	.	009	000	000	0
ABALONE	.	010	000	000	0
ABALONE	.	011	000	000	0
ABALONE	.	012	000	000	0
ABALONE	.	013	001	000	1
ABALONE	.	014	000	000	0
ABALONE	.	015	001	000	1
ABALONE	.	016	000	000	0
SEA URCHIN (RED)	.	099	*		

FOOTNOTES TO APPENDIX 1

Substrate type:

BLD	= boulder
BRK	= bed rock
BRK (CRV)	= bed rock (with crevices)
BRK (SMO)	= bed rock (smooth)
CBL	= cobble
GRV	= gravel
SHL	= shell
SMO	= smooth

Quadrat Number: 99 this is the estimated density of the animals in question over the entire site area.